

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.







1.96
R3/Fec

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

COLORADO, RIO GRANDE, MISSOURI
and
ARKANSAS DRAINAGE BASINS

February 1, 1940

* * * * *
* * * * *
* * * * *
* * * * *
* * * *
* * *
* *
*

Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

February 10, 1940

NEW SERIES AND INVESTIGATION WATER TOWNSHIP

For the

BOGARD, E. O. GRANT, MISSOURI

ARKANSAS TOWNSHIP EASTING

February 1, 1910



Issued by the
United States Department of Agriculture
Bull. 200, revised 2-1910
Bureau of Investigation
In cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

February 1, 1910

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
FOR MONTANA, COLORADO, WYOMING, NEW MEXICO AND ARIZONA

February 1, 1940

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service, of the U. S. Department of Agriculture, in cooperation with State departments, other Federal bureaus and local organizations. The snow measurements are made principally by field personnel of the following organizations: U. S. Forest Service, U. S. National Park Service, U. S. Bureau of Reclamation, and U. S. Indian Service. This work is otherwise conducted cooperatively with the State Engineers of Wyoming, Colorado, and New Mexico, State Experiment Stations, and various municipalities, irrigation associations, power companies and others. Precipitation records are supplied by the U. S. Weather Bureau.

COLORADO

For the Colorado River watershed above Grand Junction nineteen snow courses show, on the average, a snow depth of 25.6 inches and water content of 5.5 inches. These averages for the same area, February 1 of last year, were 41.5 inches and 10.1 inches. For the Yampa River four snow courses show an average water content of 8.8 inches, while last year the average was 12.3 inches. On the White River watershed the record from only two snow courses is available for comparison. The average water content was 7.9 inches. For February 1 of last year the average was 12.4 inches. For the Gunnison the average water content for eleven snow courses this year was 7.8 inches. The record last year for this same area was 7.6 inches. On the Dolores watershed the three snow courses, February 1 of this year, show on the average a water content of 6.2 inches. Last year at this time the average was 4.7 inches, indicating a better condition than that of a year ago. On the San Juan watershed five snow courses show, on the average, a water content of 6.6 inches. For this same area last year the water content was 5.2 inches, which also indicates improved snow conditions in this area. Over the South Platte watershed in Colorado sixteen snow courses on February 1 this year show, on the average, a water content of 4.6 inches; for last year at this time it was 7.5 inches. For the Arkansas River watershed the average for February 1 of this year on eight snow courses was 4.6 inches of water, while for last year the average was 7.0 inches. For the Rio Grande watershed, San Luis Valley in Colorado, eleven snow courses show an average water content of 4.4 inches for this year; the average values on five courses last February 1 over this same area was 7.5 inches. A summary of the snow survey observations is given in the accompanying table.

Generally, for Colorado the snow depth and density are both less than a year ago. However, on the watersheds of the Gunnison, Dolores and San Juan Rivers in southwestern Colorado, the snow depth and density are greater than last year. The soil moisture, particularly over the mountain area, is low because of the extreme deficiency in rainfall during the past autumn. Soil moisture over the valley irrigated areas is fair to good at this time. The present storage in reservoirs is considerably below normal for this time of year and the stream flow much below normal.



WYOMING

On the watershed of the North Platte River exclusive of the Laramie River the water content of the snow on February 1, 1940, as shown by the observations on 9 courses was 8.0 inches. Last year it was 13.8 inches at this time. Nine snow courses on the watershed of the Laramie had an average water content of 4.7 inches on February 1, whereas last year the water content of the snow on this date was 7.2 inches. On the watershed of the Yellowstone River in Wyoming and Montana, the water content of the snow for three courses was 3.4 inches on February 1, this year, and 4.5 inches last year. Comparable readings are not available for the Bighorn River watershed, but readings on three courses on February 1, showed an average water content of snow of 6.0 inches. Last year it was 17.2 inches on two courses, one of which was included in the 1940 observations. The density of the snow cover on the watersheds of the streams in Wyoming is generally less this year than it was last year at this time. Soil moisture is generally deficient in Wyoming, particularly in the subsoil. Stream flow and reservoir storage are both below normal.

MONTANA

The water content of the snow on four courses on the watershed of the Jefferson River was 4.5 inches on February 1, 1940 and 5.5 inches on February 1, 1939. Four courses on the watershed of the Madison River had an average water content of 5.7 inches on February 1, this year. Last year on this date it was 11.7 inches. On the watershed of the Gallatin River the water content of the snow was 4.1 inches this year and 5.9 inches last year, as shown by observations on three courses. Four courses on the watershed of Ten Mile Creek, a tributary of the Missouri River, had a water content of 3.1 inches in 1940 and 5.9 inches in 1939. Last year the snow course on the Marias River showed a water content of 17.5 inches. This year it was only 3.4 inches. Rainfall in December improved moisture condition of surface soil, but subsoil is very dry.

NEW MEXICO AND ARIZONA

Over the Rio Grande watershed in both Colorado and New Mexico twenty-two snow courses were reported as of February 1, 1940. The average figures for these are as follows: snow depth, 18.4 inches; water content, 4.4 inches. Last year at this time there were fourteen courses reported for this area, showing the average to be 28.6 inches and 6.0 inches respectively. By comparison the snow cover at this time indicates relatively more water for lesser depths or greater density. For the Gila drainage six snow courses were reported showing on the average a water content of 2.1 inches. These same courses for last year gave an average value of 5.1 inches. On February 1 the water content of the snow cover on this watershed was only about 40 percent of that of last year at this time, but the density of the snow is greater. At McNary, Arizona, since the first of the month, snow and rain have occurred and above elevations of 8,000 feet 1½ to 2 feet of new snow has fallen. For the Springerville area in Arizona some melting has occurred. Streams, however, have not risen and the small reservoirs have gained no storage. Soil moisture is reported to be still considerably below normal in this area.



P R E C I P I T A T I O N D A T A

WATERSHED	STATE	Precipitation		Departure		Precipitation		Departure	
		October 1 to	January 31	From	Normal	January	Normal	from	Normal
		Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
Missouri	East. Mont.	1.40		-1.07		0.25			
Missouri	Cent. Mont.	2.57		-0.59		0.65		-0.04	
Missouri	North. Wyo.	2.79		-1.86		1.19		+0.11	
North Platte	Wyoming	2.79		-0.67		1.40		+0.53	
South Platte	Colorado	2.32		-1.32		1.64		+0.93	
Arkansas	Colorado	2.31		-0.80		1.13		+0.69	
Canadian	New Mexico	2.12		-0.56		0.45		+0.10	
Rio Grande	Colorado	2.64		-1.77		1.40		+0.34	
Rio Grande	New Mexico	3.72		-0.29		1.39		+0.40	
Pecos	New Mexico	2.71		-0.16		0.42		-0.10	
Colorado	Colorado	4.47		-1.07		2.67		-1.20	
Green	Wyoming	2.43		+0.13		1.41		+0.99	
San Juan	New Mexico	2.74		-0.63		1.04		+0.04	
Gila	Arizona	2.84		-2.03		1.13		-0.38	
Gila	New Mexico	3.46		-0.19		0.56		-0.33	

WATER SUPPLY OUTLOOK FOR THE COMING SEASON

The snow cover in the high mountain areas of Colorado, Wyoming and New Mexico has increased materially during January. Generally throughout the mountain and plains areas the soil moisture was low when winter snows came. Reports have been received of dry soil beneath the snow cover on some of the snow courses. Because of the extreme dryness of the mountain soil, much of the snow melt will be absorbed and retained. Heavy snowfalls will be required in the mountain areas before late spring to insure normal runoff.



SUMMARY OF FEBRUARY 1 SNOW SURVEYS AND COMPARISON OF DATA

WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth		Water Content			Number Courses Reporting 1940	Snow Density		1940 Water Content in Percent of	
	Five Year Avg.*	1939	1940	Five Year Avg.*	1939		Five Year Avg.*	1940	Five Year Avg.*	1939
	In.	In.	In.	In.	In.		Percent	Percent	Percent	Percent
COLORADO RIVER										
Colorado River**	33.5	41.5	25.6	7.8	10.1	5.5	23	24	70	54
Yampa River	43.3	50.1	35.5	10.6	12.8	8.8	25	26	82	69
White River	40.3	49.2	30.6	10.4	12.4	7.9	26	25	76	64
Gunnison River	31.5	36.9	31.0	7.4	7.6	7.8	23	21	105	102
Dolores River	27.9	32.3	23.5	5.5	4.7	6.2	20	15	112	132
San Juan River	22.1	27.3	25.6	4.8	5.2	6.6	22	19	137	127
Gila River	12.0	23.8	6.7	2.8	5.1	2.1	23	21	75	41
MISSOURI RIVER										
Jefferson River	25.8	27.8	21.4	5.8	5.5	4.5	22	20	78	82
Madison River	38.5	46.7	24.8	9.9	11.7	5.7	26	25	58	49
Gallatin River	24.6	27.1	18.9	5.2	5.9	4.1	21	22	79	70
Ten Mile Creek	20.9	25.0	14.9	4.5	5.9	3.1	22	24	69	53
Marias River	35.3	55.4	12.0	10.8	17.5	3.4	30	32	31	19
Yellowstone River	21.7	20.7	15.8	4.8	4.5	3.4	22	22	71	76
Bighorn River	---	59.5	24.5	---	17.2	6.0	---	29	---	35
North Platte River	47.4	52.1	40.4	11.9	13.8	8.0	25	26	67	58
Laramie River	26.4	80.2	23.6	6.2	7.2	4.7	23	24	76	65
South Platte River	25.7	29.8	20.9	6.3	7.5	4.6	24	25	73	61
ARKANSAS RIVER										
Arkansas River	26.4	32.9	19.9	5.8	7.0	4.6	22	21	79	66
Canadian River	---	---	11.0	---	---	3.0	---	---	---	---
RIO GRANDE										
Rio Grande	23.2	28.6	18.4	5.1	6.0	4.4	22	21	86	73

*Some for shorter periods.

**Above Grand Junction, Colorado.



100

COLORADO RIVER WATERSHED

Summary of Federal and State Cooperative Snow Surveys

Issued Feb. 10, 1940, at Fort Collins, Colo.

Main Drainage and Snow Course		Local Drainage	State	Location Locality	Description	Elev.	National Forest	Feb. 1 Snow Course Measurements			
No.	Snow Course							Av. Snow Depth, 1939	Av. Snow Depth, 1940	Av. Water Content, 1939	Av. Water Content, 1940
COLORADO RIVER (Above Grand Junction)											
7	Park View*	Willow Cr.	Colo.	7mi. SE. Rand	24-5N-78W	9200	Routt	24.9	31.9	18.1	5.4
10	Lynx Pass	Rock Cr.	"	7mi. NE. Toponas	27-2N-83W	9100	Routt	35.7	44.9	27.3	8.2
12	Phantom Valley	Colorado R.	"	11mi. N. Grand L.	7-5N-75W	9300	Ry. Mt. N.P.	25.1	31.2	20.2	6.1
16	Berthoud Pass	Fraser R.	"	4mi. S. West Port.	35-2S-75W	9700	Arapaho	42.1	47.9	41.9	9.6
19	Tennessee Pass*	Eagle River	"	Tennessee Pass	21-8S-80W	10200	Cochetopa	24.1	32.2	17.6	4.3
33	Ind. Pass Tun.	Lincoln Gulch	"	W. Port. Tunnel	30-11S-82W	10200	Holy Cross	38.8	49.0	27.0	10.3
34	N. Lost Trail Cr.	Crystal R.	"	3mi. E. Marble	20-11S-87W	9200	Holy Cross	32.3	40.6	26.3	7.3
54	Maroon Lake	Maroon Cr.	"	8mi. SW. Aspen	7-11S-85W	9300	"	34.1	45.9	22.9	7.7
56	Mesa Lakes	Mesa Cr.	"	15mi. E. Palisade	35-11S-96W	10000	Grand Mesa	34.6	48.2	27.9	8.6
37	M. Fork Camp Gr.	Williams Fork	"	13mi. N. Dillon	16-3S-77W	9000	Arapaho	27.0	36.1	21.5	6.0
44	Fiddler Gulch	Eagle River	"	2mi. E. Mitchell	1-8S-80W	11000	Holy Cross	35.2	41.9	24.0	7.6
45	Nast	Frying Pan R.	"	23mi. SE. Basalt	1-9S-83W	8700	"	21.8	31.3	15.4	4.5
69	Arrow	S. Ranch Cr.	"	Arrow	34-1S-75W	9900	Arapaho	29.7	29.4	28.4	5.9
62	Willow Creek P.	Willow Cr.	"	Willow Cr. Pass	1-4N-78W	9500	"	33.3	39.7	23.8	7.5
64	N. Inlet Grand L	N. Inlet Cr.	"	4mi. N. E. Grand L.	26-4N-75W	9000	Ry. Mt. N.P.	27.0	30.3	22.3	6.6
65	Lake Irene	Beaver Cr.	"	2mi. SW. Milner P.	8-5N-75W	10600	"	51.7	58.0	36.2	14.9
66	Thunderbolt Pk.	Buchanan Cr.	"	5mi. E. Monarch L.	22-2N-74W	9500	Arapaho	46.9	58.9	32.9	12.1
79	Fremont Pass #2	Blue River	"	Fremont Pass	2-8S-79W	11400	"	39.4#	49.3	31.1	8.3#
70	Lapland	St. Louis Cr.	"	7mi. SW. Fraser	16-2S-76W	9300	"	--	--	22.3	--
					Average for Drainage			33.5	41.5	25.6	7.8
YAMPA RIVER											
6	Dry Lake	Soda Creek	Colo.	4mi. NE. Steam. Spgs	26-7N-84W	8200	Routt	--	--	38.7	--
9	Elk River	Independence C.	"	Columbine	6-10N-85W	8700	"	39.6	44.5	34.7	9.8
10	Lynx Pass*	Morrison Cr.	"	7mi. NE. Toponas	27-2N-83W	9100	"	35.7	44.9	27.3	8.2
8	Columbine Lodge*	Harrison Cr.	"	Rbt. Ears Pass	21-5N-82W	9300	"	54.7	61.0	41.4	13.7
					Average for Drainage			43.3	50.1	35.5	10.6
WHITE RIVER											
35	Burro Mountain	N. Elk Creek	Colo.	8mi. S. Buford	15-2S-91W	9000	White River	43.1	51.8	33.0	11.4
36	Rio Blanco	White River	"	4mi. NW. Trappers L	23-1N-88W	8500	"	37.5	46.7	28.3	9.5
					Average for Drainage			40.3	49.2	30.6	10.4

*On adjacent drainage. #Readings on original course.

7.9



COLORADO RIVER WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued Feb. 10, 1940, at Fort Collins, Colo.

Main Drainage and Snow Course	Local Drainage	State	Location Locality	Description	Elev.	National Forest	Feb. 1 Snow Course Measurements			
							Av. Snow Depth	Av. Water Content	1939	1940
No.							in.	in.	in.	in.
GUNNISON RIVER										
85	Trickle Divide	Colo.	13mi. N. Cedaredge	23-11S-9W	10000	Grand Mesa	---	47.1	---	10.4
86	Trickle	"	11mi. N. Cedaredge	34-11S-9W	9700	"	---	39.9	---	7.6
87	Park Reservoir	"	11mi. N. Cedaredge	34-11S-9W	9500	"	---	42.5	---	9.8
18	Crested Butte	"	3mi. N. Crested B.	22-13S-8W	9000	Gunnison	34.6	34.7	6.9	5.4
53	Alexander Lake	"	10mi. N. Cedaredge	2-12S-9W	10000	Grand Mesa	46.8	30.6	11.1	8.1
55	Snowshoe Cr.	"	10mi. S. Paonia	14-13S-9W	7400	Gunnison	22.9	26.5	7.8	9.2
58	Iron Mountain	"	6mi. S. Ouray	29-43S-7W	9300	Uncolomungo	27.4	26.1	6.6	7.4
46	Park Cone	"	Taylor Park Res.	19-14S-8W	9700	Gunnison	---	---	---	---
38	Sunshine Mt.	"	10mi. W. Lake City	35-44N-6W	10200	Gunnison	28.2	22.2	6.2	5.6
42	Marshall Creek	"	Marshall Pass	24-48N-6E	10850	Cochotopa	30.4	28.3	6.9	7.4
44	Poncha Creek*	"	Marshall Pass	19-46N-7E	10400	Cochotopa	25.9	24.1	6.3	7.1
89	Porphyry Cr.	"	Monarch Pass	19-49N-6E	10800	"	---	31.1	---	7.6
				Average for Drainage			31.5	36.9	7.4	7.8
DOLORES RIVER										
23	Rico	Colo.	2mi. S. Rico	11-3-11W	8700	Montezuma	22.6	21.6	3.9	6.0
24	Telluride	"	Telluride	6-42N-8W	8600	"	27.6	22.2	4.7	4.2
25	Lizard Head	"	10mi. N. Rico	24-41N-10W	10500	"	33.6	26.8	7.8	8.1
				Average for Drainage			27.9	23.5	5.5	6.1
SAN JUAN RIVER										
29	Upper San Juan	Colo.	4mi. W. Wolf Cr. P.	10-27N-1E	10000	San Juan	---	37.1	---	10.1
30	Silverton Sub. S.	"	2mi. NE. Silverton	10-41N-7W	9400	"	16.6	19.1	3.6	3.4
31	Cascado	"	5mi. N. Electric L.	12-39N-9W	8850	"	27.6	19.6	6.0	5.6
26	Wolf Creek Pass*	"	Wolf Creek Pass	4-37N-2E	10000	Rio Grande	---	32.0	---	8.7
17	Chama Divide	N. Mex.	6mi. W. Chama	36-92-10E-7W	7700	Off. Forest	---	24.7	---	5.0
				Average for Drainage			22.1	27.3	4.8	6.0
GILA RIVER										
11	Trisco Divide	N. Mex.	6mi. S. Luna	31-6S-70W	8000	Apache	5.9	4.2	1.4	1.2
14	State Line	"	5mi. W. Luna	6-6S-21W	8000	"	8.1	6.1	2.0	1.9
3	Patricio	Ariz.	6mi. SE. Patricio	24-6S-90E	7500	"	10.6	5.4	2.3	1.6
4	Beaver Head	"	4mi. SE. Alpine	15-41N-30E	8000	"	14.8	9.5	3.6	3.4
5	Coronado Trail	"	4mi. S. Alpine	36-5N-30E	8000	"	17.0	10.5	3.7	3.4
6	McNary	"	McNary	---	7400	W. Mt. Ind. S.	17.0	5.0	3.8	1.1
				Average for Drainage			12.0	6.7	3.2	2.1

*On adjacent drainage



MISSOURI & ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued Feb. 10, 1940, at Fort Collins, Colo.

No.	Main Drainage and Snow Course	Local Drainage	Location		Elev.	National Forest	Feb. 1 Snow Course Measurements					
			State	Locality			Description	Av. Snow Depth			Av. Water Content	
								In.	In.	Avg.	In.	In.
JEFFERSON RIVER												
9	Gibbons Pass	N.Fk. Big Hole	Mont.	Gibbons Pass	7100	Beaver Head	--	--	31.8	--	--	7.8
6	Camp Creek*	Red Rock	Idaho	6mi. N. Spencer	6800	Targhee	19.2	21.7	15.8	4.6	4.1	3.0
7	East Fork R.S.*	Rock Creek	Mont.	13mi. NE. Sula	5400	Bitterroot	--	--	--	--	--	--
7	Moose Creek*	N.Fk. Big Hole	Idaho	3mi. S. Gibbons Pass	6200	Salmon	32.5	34.0	26.5	6.9	6.9	5.1
26	Pipestone Pass	Pipestone Cr.	Mont.	Pipestone Pass	7200	Deer Lodge	--	--	11.4	--	--	2.0
				Average for Drainage			25.8	27.8	21.4	5.8	5.5	4.5
MADISON RIVER												
2	Aster Creek*	Firehole River	Wyo.	Lewis Lake	7700	Yel. Nat. P.	43.0	43.0			13.0	
	Big Springs	North Fork	Idaho	6mi. SE. L. Henry	6500	Targhee	48.0				11.4	
	Hebgen Dam	Cabin Cr.	Mont.	Hebgen Dam	6550	Gallatin	35.5	38.0	24.6	8.0	8.9	5.3
8	Lewis L. Divide*	Firehole River	Wyo.	3mi. S. Lewis L.	7900	Yel. Nat. P.	60.1	74.8	38.5	18.5	21.0*	9.9*
	Twenty-One Mile*	Grayling Cr.	Mont.	8mi. S. Gallatin	7150	" "	32.5	39.1	13.3	7.7	9.1	4.1
15	West Yellowstone	South Fork	Mont.	W. Yellowstone	6700	Gallatin	25.8	32.4	17.9	5.3	6.8	3.4
				Average for Drainage			38.5	46.7	24.8	9.9	11.7	5.7
GALLATIN RIVER												
	Mystic Lake No. 1	Bozeman Cr.	Mont.	12mi. SE. Bozeman	6600	Gallatin	21.4	21.4	19.8	4.1	4.3	4.0
	Mystic Lake No. 2	"	"	12mi. SE. Bozeman	6600	"	19.8	20.8	18.5	3.9	4.2	4.2
	Twenty-One Mile	Gallatin R.	"	8mi. S. Gallatin	7150	Yel. Nat. P.	32.5	39.1	18.3	7.7	9.1	4.1
				Average for Drainage			24.6	27.1	18.9	5.2	5.9	4.1
MISSOURI RIVER												
TENMILE CREEK												
5	Chessman Res.	Tenmile Cr.	Mont.	11mi. SW. Helena	6200	Helena	11.6	11.5	8.4	2.6	2.3	1.6
35	Tenmile Cr. Lower	"	"	17mi. SW. Helena	6250	"	18.8	23.3	14.1	3.8	5.0	2.4
36	Tenmile Cr. Middle	"	"	" "	6800	"	24.8	31.1	17.2	5.1	7.4	3.6
37	Tenmile Cr. Upper	"	"	" "	8000	"	28.4	34.2	20.0	6.4	9.0	4.7
				Average for Drainage			20.9	25.0	14.9	4.5	5.9	3.1
MARIAS RIVER												
10	Marias Pass	Two Medicine	Mont.	Summit	5250	Glacier NP	35.8	55.4	12.0	10.8	17.5	3.4

*On adjacent drainage

*Jan. 16



MISSOURI & ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued Feb. 10, 1940, at Fort Collins, Colo.

Main Drainage and Snow Course		Local Drainage		Location		Elev.	National Forest	Feb. 1 Snow Course Measurements					
No.				State	Locality			Descrip- tion	Av. Snow Depth	Av. Water Content	1939	1940	1939
YELLOWSTONE RIVER													
	Blacktail Deer Cr.	Blk. Tail Deer	Wyo.	11 mi. SE. Gardiner	44-9N110-6W	7500	Yel. Nat. P.	23.7	22.1	17.0	5.7	5.4	4.0
	Camp Senia	W. Br. Rock Cr.	Mont.	10 mi. W. Red Ldge.	2-8S-18E	7870	Custer						
	Beaver Dams	Blk. Tail Deer	Wyo.	11 mi. SE. Gardiner	44-9N110-6W	7200	Yel. Nat. P.	18.9	17.5	15.4	4.2	3.6	2.9
	Lupine Creek	Lupine Cr.	Wyo.	11 mi. SE. Gardiner	44-9N110-6W	7300	" "	22.5	22.4	15.1	4.5	4.4	3.3
					Average for	Drainage		21.7	20.7	15.8	4.8	4.5	3.4
BIGHORN RIVER													
	Brooks Lake No. 1*	Wind River	Wyo.	Brooks Lake	25-44N-110W	9000	Washakie		60.0	37.0		16.3	8.1
	Togwotee Pass	" "	"	Togwotee Pass	29-44N-110W	9600	Teton		59.0			18.0	
50	Brooks Lake #3	" "	"	Brooks Lake	23-44N-110W	9200	Washakie			25.7			6.8
14	Dome Lake	Goose Cr.	"	Dome Lake	11-57N-87W	8800	Big Horn			10.9			3.0
					Average for	Drainage			59.5	24.5		17.2	6.0
NO. PLATTE RIVER													
7	Bottle Creek	Encampmt Cr.	Wyo.	7 mi. SW. Encampmt	24-14N-85W	8200	Medicine Bow	32.1	35.9	25.1	7.4	9.1	4.2
8	Columbine Lodge	Grizzly Cr.	Colo.	Rbt. Ears Pass	21-5N-82W	9300	Routt	54.7	61.0	41.4	13.7	16.6	9.9
36	N. Barrett Cr. #2	N. Barrett Cr.	Wyo.	Cent. Saratoga	30-16N-80W	9400	Medicine Bow	58.7	62.1	53.4	15.0	16.4	9.2
37	North French Cr.	N. French Cr.	"	" "	27-16N-80W	10200	" "	70.3	73.9	62.1	19.6	21.3	11.5
9	Old Battle	Encampmt Cr.	"	12 mi. W. Encampmt	29-14N-85W	9800	" "	64.8	70.2	60.0	16.7	18.9	12.3
7	Park View	Illinois Cr.	Colo.	7 mi. SE. Rand	24-5N-78W	9200	Routt	24.9	31.9	18.1	5.4	7.3	2.3
39	Ryan Park #2	N. Barrett Cr.	Wyo.	Cent. Saratoga	34-16N-81W	8400	Medicine Bow	38.6	40.5	33.4	9.0	9.7	6.4
8	Webber Springs	Encampmt Cr.	"	10 mi. W. Encampmt	27-14N-85W	9000	" "	39.0	41.5	34.1	9.2	10.9	6.5
1	Cameron Pass	Michigan Cr.	Colo.	Cameron Pass	2-6N-76W	10300	Roosevelt	43.8	51.6	36.1	11.6	13.8	9.5
					Average for	Drainage		47.4	52.1	40.4	11.9	13.8	8.0
LARAMIE RIVER													
3	Brooklyn Lake	Nash Fork	Wyo.	7 mi. NW. Centennial	11-16N-79W	10200	Medicine Bow	41.9	45.1	33.0	11.8	13.7	6.7
4	W. Port. G-P Tunnel	Laramie R.	Colo.	4 mi. N. Chambers L.	7-8N-75W	8600	Roosevelt	23.4	27.8	19.1	5.6	6.6	4.6
11	Fox Park	Fox Creek	Wyo.	Fox Park	21-13N-78W	9200	Medicine Bow	24.0	23.0	27.9	5.6	6.3	5.0
36	Hairpin Turn #2	Nash Fork	"	5 mi. NW. Centennial	24-16N-79W	9500	" "	24.5	27.9	16.7	5.7	6.8	3.2
35	Libby Lodge #2	Libby Cr.	"	3 mi. NW. Centennial	29-16N-78W	8700	" "	20.3	24.3	17.1	3.9	5.0	2.3
34	Pole Mountain #2*	Soldier Cr.	"	10 mi. SE. Laramie	35-15 N-72W	8700	" "	19.2	24.8	13.4	3.9	4.5	2.5
50	Deadman Hill*	Deadman Cr.	Colo.	10 mi. W. R. Feather	26-10N-75W	10200	Roosevelt	30.9	37.0	24.8	7.0	8.3	5.6
71	Deadman Hill #2*	Deadman Cr.	"	8 mi. SW. R. Feather	6-9N-74W	10200	" "	26.6	31.6	21.5	5.8	6.6	4.9
88	Roach	LaGarde Cr.	"	8 mi. NW. Glendevey	5-10N-77W	9800	" "			38.5			7.1
	Adjacent Drainage				Average for	Drainage		26.4	30.2	23.6		7.2	4.7

*Adjacent Drainage

MISSOURI & ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued Feb. 10, 1940, at Fort Collins, Colo.

No.	Main Drainage and Snow Course	Local Drainage	State	Location		Elev.	National Forest	Feb. 1 Snow Course Measurements			
				Locality	Description			Av. Snow Depth		Av. Water Content	
								In. 1939	In. 1940	In. 1939	In. 1940
SO. PLATTE RIVER											
3	Big South	Poudre R.	Colo.	2mi. E. Chambers L.	33-8N-75W	8600	Roosevelt	6.8	4.9	8.8	1.3
1	Cameron Pass	Joe Wright Cr.	"	6mi. W. Chambers L.	2-6N-76W	10300	"	43.8	51.6	36.1	11.6
2	Chambers Lake	Poudre R.	"	Chambers L.	6-7N-75W	9000	"	19.2	20.1	18.3	4.5
50	Deadman Hill	N. Poudre R.	"	10mi. W. R. Feather	26-10N-75W	10200	"	30.9	37.0	24.8	7.0
71	Deadman Hill #2	"	"	8mi. SW. R.	6-9N-74W	10200	"	26.6	31.6	21.5	5.8
68	Hour Glass Lake	Lit. S. Poudre	"	2mi. NW. Pingree P.	18-7N-73W	9500	"	19.4	21.1	17.6	4.0
5	E. Port. Moffat T.	S. Boulder Cr.	"	East Portal	2-2S-74W	9400	"	9.1	6.6	7.8	2.1
15	Fairplay	S. Platte	"	Fairplay	33-9S-77W	10000	Pike	2.2	4.4	0.0	0.2
67	Fall River	Fall River	"	12mi. W. Estes P.	6-5N-74W	10600	Ry. Mtn. N.P.	39.2	40.3	38.0	11.0
14	Hoosier Pass	S. Platte	"	Hoosier Pass	13-8S-78W	11400	Pike	26.2	36.0	16.5	5.1
34	Pole Mountain #2	Crow Cr.	Wyo.	10mi. SE. Laramie	35-15N-72W	8700	Medicine Bow	19.2	24.8	13.4	3.9
60	University Camp #2	N. Boulder Cr.	Colo.	5mi. SW. Ward	28-1N-73W	10300	Roosevelt	39.7	46.9	32.5	11.4
41	Wild Basin	E. St. Vrain	"	5mi. W. Allens P.	24-3N-74W	10000	Ry. Mtn. N.P.	26.3	34.2	20.4	6.0
65	Lake Irene*	Big S. Poudre	"	1mi. SW. Milner P.	8-5 N-75W	10600	"	51.7	58.0	36.2	14.9
61	Loveland Pass #2	Clear Creek	"	10mi. W. Georgetown	27-4S-76W	10100	Arapaho	--	--	24.0	--
83	Jefferson Cr. #2	Jefferson Cr.	"	5mi. NW. Jefferson	14-7S-76W	10100	Pike	--	--	18.9	--
								25.7	29.8	20.9	6.3
ARKANSAS RIVER											
79	Fremont Pass #2	E. Fork Ark. R.	Colo.	Fremont Pass	2-8S-79W	11300	Arapahoe	39.1	49.3	31.1	8.3
42	Marshall Creek*	Poncha Cr.	"	Marshall Pass	24-48N-6E	10800	Cochetopa	30.4	36.6	28.3	6.9
43	Poncha Creek	Poncha Cr.	"	"	19-48N-7E	10500	Cochetopa	23.9	30.5	24.1	6.3
19	Tennessee Pass	Tennessee Fk.	"	Tennessee Pass	21-8S-80W	10200	Cochetopa	24.1	32.2	17.6	4.3
21	Twin Lakes Tun.	Lake Cr.	"	9mi. W. Tw. Lakes	22-11S-82W	10500	Cochetopa	27.5	33.2	19.6	6.8
78	Four Mile Park #2	"	"	3mi. SW. Tw. Lakes	23-11S-81W	9700	Cochetopa	13.3	15.8	10.8	2.2
72	Whiskey Creek #2	Whiskey Creek	"	Whiskey Cr. Pass	37.29N-105.20W	10300	Maxwell Grant	--	--	12.4	--
74	La Veta Pass #2	San Cristo Cr.	"	La Veta Pass	22-28S-70W	9300	Off Forest	--	--	15.2	--
								26.4	32.9	19.9	5.8
								--	--	--	7.5
								--	--	--	7.5
								39.1	49.3	31.1	8.3
								30.4	36.6	28.3	6.9
								23.9	30.5	24.1	6.3
								24.1	32.2	17.6	4.3
								27.5	33.2	19.6	6.8
								13.3	15.8	10.8	2.2
								--	--	12.4	--
								--	--	15.2	--
								26.4	32.9	19.9	5.8

*Adjacent Drainage

#Readings from original course.

Examined by J. H. ...
 ...
 ...

Station	Locality	Altitude	Remarks
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Station	Locality	Altitude	Remarks
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50

Examined by J. H. ...
 ...
 ...

RIO GRANDE WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued Feb. 10, 1940, at Fort Collins, Colo.

No.	Main Drainage and Snow Course	Local Drainage	Location		State	Locality	Description	Feb. 1 Snow Course Measurements					
			Elev.	National Forest				Av. Snow Depth		Av. Water Content			
								1939	1940	1939	1940		
			In.	In.				In.	In.		In.	In.	
RIO GRANDE													
26	Wolf Creek Pass	South Fork	Colo.	Wolf Cr. Pass	4-37N-2E	10000	Rio Grande	--	32.0	--	--	8.7	
27	Upper Rio Grande	Rio Grande	"	Rio Grande Res.	13-40N-4W	9350	"	15.1	12.1	2.6	3.8	1.3	
75	Ute Ridge	"	"	"	31-41N-4W	9700	"	16.1	12.5	2.9	4.4	1.4	
76	Summitville	Wightman Cr.	"	Summitville	30-37N-4E	11500	"	50.0	43.0	12.4	13.0	11.9	
77	Cumbres Pass #2	Los Pinos R.	"	Cumbres Pass	17-32N-5E	10000	"	45.7	35.4	11.2	12.5	10.0	
80	Santa Maria	N. Clear Cr.	"	Santa Maria Res.	8-41N-2W	9700	"	12.2	8.9	2.6	3.6	1.6	
1	Red River	Red River	N. Mex.	6mi. SE. Red River	29-28N-15E	9500	Carson	--	21.0	--	--	5.0	
2	Taos Canon	Rio de Taos	"	14mi. E. Taos	10-25N-15E	9000	"	16.6	17.4	4.3	4.4	4.2	
4	Aspen Grove	Rio En Medio	"	10mi. NE. Santa Fe	12-18N-10E	9100	Santa Fe	21.3	12.4	4.4	5.6	3.3	
5	Lee Ranch	Jemez Cr.	"	5mi. NW. Bland	3-18N-4E	9050	"	22.6	16.2	4.1	4.4	3.8	
6	Canjilon	Canjilon Cr.	"	8mi. NE. Canjilon	4-26N-6E	9500	Carson	--	31.2	--	--	10.1	
7	Rio Nutrias	Rio Nutrias	"	10mi. SE. Park View	6-27N-5E	7900	"	18.6	14.8	3.4	3.2	3.7	
8	Panchuela	Panchuela Cr.	"	1mi. N. Cowles	34-19N-12E	8500	Santa Fe	16.8	10.6	3.4	4.4	2.4	
9	Hematite Park*	Red River	"	3mi. SE. Red R.	8-28N-15E	9500	Carson	--	11.0	--	--	3.0	
12	Tres Ritos	Agua Piedra	"	7mi. W. Holman	23-22N-13E	9000	"	20.5	14.6	5.0	6.5	3.6	
84	Fort Garland	Big Ute Creek	Colo.	6mi. N. Ft. Garland	13-29N-72W	8200	San CristoGr.	--	9.1	--	--	1.9	
74	LaVeta Pass #2	San Cristo Cr.	"	La Veta Pass	22-28S-70W	9300	Off. Forest	--	15.2	--	--	3.0	
16	Jicarilla	Rock Lake Cr.	N. Mex.	15mi. S. Dulce	9-29N-1W	8500	Jicarilla Res.	--	15.4	--	--	3.6	
17	Chama Divide	Willow Cr.	"	6mi. W. Chama	36-90N-106.7W	7750	Off Forest	--	24.7	--	--	5.2	
82	Culebra	Culebra R.	Colo.	12mi. E. San Luis	37-20N-105.2W	10000	San CristoGr.	--	20.0	--	--	4.5	
47	Silver Lakes	Alamosa R.	"	1mi. S. Silver L.	15-36N-5E	9600	Rio Grande	--	11.8	--	--	2.1	
49	River Springs	Conejos R.	"	10mi. W. Mogote	25-33N-6E	9300	"	--	16.7	--	--	2.3	
								23.2	28.6	5.1	6.0	4.4	
CANADIAN RIVER													
9	Hematite Park	Moreno Cr.	N. Mex.	3mi. SE. Red R.	8-28N-15E	9500	Carson	--	11.0	--	--	3.0	
10	Ocate Mesa	Ocate Cr.	"	3mi. E. Black Lake	25-24 N-16E	9200	Off. Forest	--	--	--	--	--	

*On adjacent drainage.

